Institute for Materials Science

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Institute for Materials Science Distinguished Lecture Series

Professor Frans Spaepen
John C. & Helen F. Franklin Professor of Applied Physics
Harvard University
Cambridge, MA

Structure of Liquids and the Crystal-Liquid Interface

Wednesday, April 27, 2016
2:00 - 3:00pm
MSL Auditorium (TA-03 - Bldg 1698 - Room A103)

Abstract: Identifying the principle that underlies the structure of even the simplest liquids is an enduring scientific challenge. Starting with the basic facts about liquids, this talk will critically review the structural models that have been proposed over the decades. In the picture that emerges, the liquid is a phase in its own right (not a defective crystal, nor simply a dense gas) with a polytetrahedral structure. This structural principle can be used to understand the interface between crystals and liquids and its role as the barrier for crystal nucleation from the melt. Colloidal systems, in which the particles can be optically tracked in space and time, provide instructive examples.

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Bio: Frans Spaepen is John C. and Helen F. Franklin Professor of Applied Physics at Harvard University. He got his undergraduate degree, in Metallurgical Engineering, at the K.U. Leuven in 1971, and a Ph.D. in Applied Physics from Harvard University in 1975. He joined the faculty of the Division of Applied Sciences at Harvard in 1977 as Assistant Professor, was appointed Associate Professor in 1981, and Full Professor in 1983. In 1984 and 2007 he was a Visiting Professor at the University of Leuven, and in 2000-01 a Humboldt visitor in Köln and Jülich. From 1990 till 1998 he was Director of the Harvard Materials Research Laboratory/Materials Research Science and Engineering Center. From 2002 to 2013 he was the Director of the Rowland Institute at Harvard. In 2008-09 he was Interim Dean of the School of Engineering and Applied Sciences and in 2009-10, he was Interim Director of Harvard's Center for Nanoscale Systems.

His research interests span a wide range of experimental and theoretical topics in materials science, such as amorphous metals and semiconductors (viscosity, diffusion, mechanical properties), the structure and thermodynamics of interfaces (crystal/melt, amorphous/crystalline semiconductors, grain boundaries), mechanical properties of thin films, and colloidal systems as models for the study of dynamics and defects in crystals and glasses.

Prof. Spaepen is a Fellow of the American Physical Society (Chairman, Division of Materials Physics, 1992), of the Materials Research Society (Councilor: 1986-89; 1990-93; Chairman, Program Committee, 1993-2000), and of the TMS. He is a member of the National Academy of Engineering, a member of the Vlaamse Academie van Wetenschappen en Kunsten, an External Member of the Max-Planck Society, and a member of ASM. He was co-editor of Solid State Physics, and an editorial board member of a number of materials science journals.

To meet with Professor Spaepen or for general information contact Caryll Blount, IMS Administrator
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Hosted by Alexander Balatsky * Director of the Institute for Materials Science

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